



Review

Gastrocnemius recession for foot and ankle conditions in adults: Evidence-based recommendations



Chris C. Cychosz^a, Phinit Phisitkul^{b,*}, Daniel A. Belatti^a, Mark A. Glazebrook^c, Christopher W. DiGiovanni^d

^a University of Iowa Carver College of Medicine, Iowa City, IA, USA

^b Department of Orthopaedics and Rehabilitation, The University of Iowa Hospitals and Clinics, Iowa City, IA, USA

^c Orthopaedic Surgery, Dalhousie University, Halifax, Canada

^d Department of Orthopaedic Surgery, Harvard Medical School, Massachusetts General Hospital, 55 Fruit St, Boston, MA 02114, USA

ARTICLE INFO

Article history:

Received 8 May 2014

Received in revised form 13 November 2014

Accepted 13 February 2015

Keywords:

Gastrocnemius

Soleus

Recession

Lengthening

Systematic review

Equinus

Achilles tendinopathy

Metatarsalgia

Plantar fasciitis

ABSTRACT

Background: Gastrocnemius recession is a surgical technique commonly performed on individuals who suffer from symptoms related to the restricted ankle dorsiflexion that results when tight superficial posterior compartment musculature causes an equinus contracture. Numerous variations for muscle-tendon unit release along the length of the calf have been described for this procedure over the past century, although all techniques share at least partial or complete release of the gastrocnemius muscle given its role as the primary plantarflexor of the ankle. There exists strong evidence to support the use of this procedure in pediatric patients suffering from cerebral palsy, and increasingly enthusiastic support—but less science—behind its application in treating adult foot and ankle pathologies perceived to be associated with gastrocnemius tightness. The purpose of this study, therefore, was to evaluate currently available evidence for using gastrocnemius recession in three adult populations for whom it is now commonly employed: Achilles tendinopathy, midfoot–forefoot overload syndrome, and diabetic foot ulcers.

Methods: A systematic review of the literature was performed on December 21, 2013 using the PubMed, Scopus, and Cochrane databases along with the search term “(gastrocnemius OR gastrosoleus) AND (recession OR release OR lengthening).” This search generated 1141 results; 12 articles found in the references of these papers were also screened for inclusion. In total, 18 articles met our inclusion criteria. These articles were reviewed and assigned a classification (I–V) of Level of Evidence, according to the criteria recommended by the Journal of Bone & Joint Surgery. Based on these classifications, a Grade of Recommendation was assigned for each of the indications of interest.

Results: Grade B evidence-based literature (“fair”) exists to support the use of gastrocnemius recession for the treatment of isolated foot pain due to midfoot/forefoot overload syndrome in adults. There are some data in support of utilizing gastrocnemius recession to treat midfoot or forefoot ulcers and non-insertional Achilles tendinopathy in adults, but to date this evidence remains Grade C. Insufficient evidence (Grade I) is currently available to make any recommendation either for or against this procedure for the treatment of insertional Achilles tendinopathy.

Conclusion: Scientific literature continues to grow in support of using isolated gastrocnemius recession as an effective treatment strategy for a variety of lower limb pathologies, although it remains clear that higher evidence levels and more carefully controlled investigations will be necessary to more convincingly define the true efficacy and ideal applications of gastrocnemius recession in the adult population.

Level of evidence: Level IV systematic review.

© 2015 European Foot and Ankle Society. Published by Elsevier Ltd. All rights reserved.

* Corresponding author at: University of Iowa Hospitals and Clinics, 0102X JPP, 200 Hawkins Drive, Iowa City, IA 52242-1088, USA. Tel.: +1 319 4675014; fax: +1 319 3849303.

E-mail address: phinit-phisitkul@uiowa.edu (P. Phisitkul).

Contents

1. Introduction	78
2. Methods	78
3. Results	78
3.1. Midfoot–forefoot overload syndrome	79
3.2. Achilles tendinopathy	80
3.3. Diabetic foot ulcers	80
4. Discussion	83
5. Conclusions	85
References	85

1. Introduction

Use of gastrocnemius recession in isolation or in conjunction with release of the soleus muscle-tendon unit to correct equinus deformity dates back to the early 1800s. These procedures were originally employed for mitigating acquired plantar flexion contracture as a result of cerebral palsy in the pediatric population. More recently, however, isolated gastrocnemius contracture has become linked to a variety of pathologies of the foot and ankle in neurologically healthy adults. In 2002, DiGiovanni et al. [1] reported the prevalence of gastrocnemius contracture in patients with symptomatic pathology of the midfoot or forefoot that included metatarsalgia, Morton foot deformity, posterior tibial tendon insufficiency, and plantar fasciitis. Compared to an age-matched asymptomatic control population, these symptomatic patients were found to have a two-fold higher incidence of gastrocnemius tightness (88% versus 44%) when contracture was defined as less than 10° of dorsiflexion with the knee in extension. As part of separate investigations, Hill [2] identified that 176/209 (96.5%) of patients who presented with foot complaints showed restricted ankle dorsiflexion requiring compensation during gait, and equinus contracture of the ankle has been reported to exist in over 10% of all patients known to have diabetes [3]. Loss of limb flexibility has been linked to increased forefoot and midfoot pressures in several studies, and further associated with the potential to encourage the development of plantar surface ulcers [4].

Although isolated gastrocnemius recession has been around for about a century, literature reporting specific use of this technique as a primary intervention to treat foot pain in adults has only begun to emerge much more recently. This body of work has been addressed in both English and European literatures, including an early recount of the expansion of indications by Barouk et al. [5,6]. The evidence-based literature on this controversial topic has nearly doubled since the most recent review in 2012 by Barske et al. [7], prompting our desire to conduct a systematic review assessing the safety and efficacy of gastrocnemius recession to treat midfoot–forefoot overload syndrome, non-insertional Achilles tendinopathy, and diabetic foot ulcers in adults. To our knowledge, this is the first systematic review in the English literature to assign grades of recommendation to gastrocnemius recession as a therapeutic intervention for the indications listed above.

2. Methods

A comprehensive review of the literature was performed on December 21, 2013 using the Medline, Embase, and Cochrane databases along with the search terms “(gastrocnemius OR gastrosoleus) AND (recession OR release OR lengthening).” For the purposes of this review, gastrocnemius recession was defined as release at the proximal, middle, or distal aspect of the muscle tendon unit, with or without concomitant release of soleus fascia.

Only studies in which all patients underwent lengthening of the gastrocnemius as defined above and patient outcomes could be corroborated as resultant to this index procedure were included. Our search of the literature yielded a total of 1141 publications. Exclusion criteria, as illustrated in Table 1, consisted of pediatric populations (aged 17 or younger), review articles, computer simulations, basic science articles, mixed series outcomes in which results from tendo-Achilles lengthening (TAL) and gastrocnemius recession outcomes were pooled together, non-English language articles, and cadaver studies. In an attempt to minimize confounding of results by other procedures, studies in which concomitant procedures were performed along with the gastrocnemius recession were excluded. Due to the paucity of studies investigating isolated recession for diabetic foot ulcers, however, this was not feasible for the purposes of this review and therefore concomitant tendon balancing procedures were permitted in this category. After applying the exclusion criteria, 18 publications remained and were included in this review, as summarized in Fig. 1.

The articles vetted for further analysis were then reviewed and assigned a Level of Evidence (I–V) using criteria established by the Journal of Bone and Joint Surgery (Table 2) [8]. Based on these findings, a Grade of Recommendation was thereafter assigned for each of the indications of interest: midfoot–forefoot overload syndrome, Achilles tendinopathy, and diabetic foot ulcers (Table 3). The four grades assigned correspond to good (A), fair (B), conflicting (C), or insufficient evidence (I). A subscale proposed by Stevens et al. [9] was used to further differentiate those studies receiving a Grade of Recommendation of conflicting, or “poor”, evidence (C). Three subscripts were applied: “c” for conflicting literature, “f” for literature for, and “a” for literature against the use of gastrocnemius recession.

3. Results

Research regarding the utility of a gastrocnemius recession in the adult foot and ankle population continues to surge, and, while its collective results suggest great promise, they remain for the most part victim to insufficient study. Although a substantive number of publications are now available which can mount a fairly robust argument in favor of using gastrocnemius release to enact positive change for various types of ankle and foot pathology, review of available literature regarding both clinical application and outcome related to gastrocnemius recession reveal little Level I or II evidence, and few well-controlled studies. What has become clear is that the relative strength of the evidence supporting employment of the gastrocnemius recession varies depending on the indication for which it is applied. Fair evidence-based literature (Grade B) exists in favor of gastrocnemius recession as a therapeutic intervention for isolated foot pain due to midfoot-to-forefoot overload syndrome in adults, and weak evidence-based literature (Grade C_f) supports its use for Achilles tendinopathy and

Download English Version:

<https://daneshyari.com/en/article/4054604>

Download Persian Version:

<https://daneshyari.com/article/4054604>

[Daneshyari.com](https://daneshyari.com)